

THAT WHICH IS CLAIMED:

1. A method for preventing oxidative corrosion of a metal, comprising:  
applying an anti-corrosion composition to a surface of metal or a device  
containing a metal susceptible to oxidative corrosion, said composition comprising an  
5 effective amount of an anti-corrosion agent comprising a lower alkyl carboxylic acid  
moiety, said composition optionally further comprising a material capable of forming a  
moisture retentive barrier over a surface of said metal, wherein said composition forms an  
anti-corrosive, moisture retentive barrier over said surface.
2. The method of claim 1, wherein said lower alkyl carboxylic acid moiety is  
10 in the form of a lower alkyl carboxylic acid anion.
3. The method of claim 1, further comprising:  
preparing an anti-corrosion solution, said solution comprising an effective amount  
of an anti-corrosion agent in a polar solvent, said agent comprising a lower alkyl  
carboxylic acid moiety;  
15 applying said solution to a surface of said metal; and  
subsequently applying a moisture retentive barrier over said surface.
4. The method of claim 1, wherein said anti-corrosion agent and said  
material capable of forming a moisture retentive barrier over a surface of said metal are  
in powdered form.
- 20 5. The method of claim 1, wherein said anti-corrosion agent and said  
material capable of forming a moisture retentive barrier over a surface of said metal are  
both provided in powdered form to produce a powdered composition; and wherein said  
powdered composition is applied to a surface of said metal by powder metallurgy  
processing.
- 25 6. The method of claim 1, wherein said material capable of forming a  
moisture retentive barrier over a surface of said metal is selected from the group  
consisting of a polar liquid, a nonpolar liquid, a viscous material, an organic liquid, a  
polymeric material and a petroleum-based substance, and mixtures thereof.

7. The method of claim 1, wherein said composition further comprises any one of a polar liquid, a non-polar liquid, a surfactant, an antioxidant, an organic liquid, a polymeric material, a petroleum-based substance, a buffering material, or graphite or particulate carbon in a suspension.

5 8. The method of claim 1, wherein said anti-corrosion agent is packaged for delayed release.

9. The method of claim 8, wherein said anti-corrosion agent is encapsulated.

10. The method of claim 1, wherein in said composition, said anti-corrosion agent is present at a concentration from about 0.2 to about 60 percent by weight.

10 11. The method of claim 1, wherein said composition is first prepared in concentrated form and then diluted.

12. The method of claim 1, said method further comprising, following said applying step, the step of applying a further coating layer over said surface.

15 13. The method of claim 12, wherein said further coating layer is applied by a process selected from the group consisting of painting, electro-plating and electro-polishing.

14. The method of claim 1, wherein said applying step comprises using said composition as a lubricant for a surface of said metal.

20 15. The method of claim 1, wherein said applying step comprises using said composition as a pump oil or brake fluid.

16. The method of claim 1, wherein said lower alkyl carboxylic acid moiety is derived from a C1-C6 carboxylic acid.

17. The method of claim 1, wherein said lower alkyl carboxylic acid moiety is derived from a C1-C6 carboxylate.

18. The method of claim 17, wherein said C1-C6 carboxylate is selected from the group consisting of formate, acetate, propionate, butyrate, and 2-methyl propionate, and mixtures thereof.

19. The method of claim 18, wherein said C1-C6 carboxylate comprises a  
5 cation selected from alkali metal or alkaline earth metal cations.

20. The method of claim 19, wherein said cation is sodium.

21. The method of claim 1, wherein said lower alkyl carboxylic acid moiety is derived from sodium propionate.

22. The method of claim 1, wherein said anti-corrosion agent is ingestible by  
10 humans.

23. The method of claim 22, wherein said composition further comprises at least one additional anti-corrosive agent that is different from said lower alkyl carboxylic acid moiety and which is also ingestible by humans.

24. The method of claim 23, wherein said at least additional anti-corrosion  
15 agent comprises a 2,4-trans, trans-hexadiene moiety.

25. The method of claim 24, wherein said 2,4-trans, trans-hexadiene moiety is in the form of a 2,4-trans, trans-hexadienoic anion.

26. The method of claim 22, wherein said composition further comprises at least one compound capable of increasing the solubility of said ingestible anti-corrosion  
20 agent.

27. The method of claim 1, wherein said composition further comprises a benzoic moiety.

28. The method of claim 1, wherein said composition comprises a propionic anion, a 2,4-trans, trans-hexadienoic anion and a benzoic anion.

29. A method for preventing oxidative corrosion of a metal, said method comprising the steps of:

providing a metal or a device containing a metal wherein said metal is susceptible to oxidative corrosion;

5 preparing an anti-corrosion solution, said solution comprising an effective amount of an anti-corrosion agent dissolved in a polar solvent, said agent comprising a C1-C6 carboxylic acid moiety; and

continuously immersing said metal or said device in said solution.

30. The method of claim 29, wherein said C1-C6 carboxylic acid moiety is in  
10 the form of a propionic anion.

31. A method for preventing oxidative degradation of a substance, said method comprising the steps of:

preparing an anti-corrosion composition, said composition comprising an effective amount of an anti-corrosion agent, said agent comprising a C1-C6 carboxylic  
15 acid moiety, said composition further comprising a material capable of acting in conjunction with said anti-corrosion agent to prevent said oxidative degradation; and  
mixing said composition with a preparation of said substance.

32. The method of claim 31, wherein said C1-C6 carboxylic acid moiety is in the form of a propionic anion.

20 33. The method of claim 31, wherein said substance is a grain product.

34. The method of claim 31, wherein said substance is a plastic material.

35. A composition for preventing oxidative corrosion of a metal, comprising:  
an effective amount of an anti-corrosion agent, said agent comprising a lower alkyl carboxylic acid moiety; and

25 optionally a material capable of forming a moisture retentive barrier over a surface of said metal.

36. The composition of claim 35, wherein said lower alkyl carboxylic acid moiety is in the form of a lower alkyl carboxylic acid anion.

37. The composition of claim 35, wherein said anti-corrosion agent and said material capable of forming a moisture retentive barrier over a surface of said metal are  
5 both provided in powdered form to produce said composition.

38. The composition of claim 37, wherein said composition is powdered in final form and is capable of being applied to a surface of said metal by powder metallurgy processing.

39. The composition of claim 37, wherein said composition is liquid or  
10 viscous in final form.

40. The composition of claim 35, wherein said material capable of forming a moisture retentive barrier over a surface of said metal is selected from the group consisting of a polar liquid, a non-polar liquid, a viscous material, an organic liquid, a polymeric material and a petroleum-based substance, and mixtures thereof.

41. The composition of claim 35, further comprising any one of a polar liquid, a non-polar liquid, a surfactant, an antioxidant, an organic liquid, a polymeric material, a petroleum-based substance, a buffering material, or graphite or particulate carbon in a suspension, and mixtures thereof.

42. The composition of claim 35, wherein said anti-corrosion agent is  
20 packaged for delayed release.

43. The composition of claim 42, wherein said anti-corrosion agent is encapsulated.

44. The composition of claim 35, wherein said anti-corrosion agent is present at a concentration from about 0.2 to about 60 percent by weight.

45. The composition of claim 35, wherein said anti-corrosion agent is present  
25 at a concentration of greater than about 20 percent by weight.

46. The composition of claim 35, wherein said composition is in the form of a gel, a colloidal suspension or a foam.

47. The composition of claim 35, wherein said lower alkyl carboxylic acid moiety is derived from a C1-C6 carboxylic acid.

5 48. The composition of claim 35, wherein said lower alkyl carboxylic acid moiety is derived from a C1-C6 carboxylate.

49. The composition of claim 48, wherein said C1-C6 carboxylate is selected from the group consisting of formate, acetate, propionate, butyrate, and 2-methyl propionate, and mixtures thereof.

10 50. The composition of claim 49, wherein said C1-C6 carboxylate comprises a cation selected from alkali metal or alkaline earth metal cations.

51. The composition of claim 50, wherein said cation is sodium.

52. The composition of claim 35, wherein said lower alkyl carboxylic acid moiety is derived from sodium propionate.

15 53. The composition of claim 35, wherein said anti-corrosion agent is ingestible by humans.

54. The composition of claim 53, wherein said composition further comprises at least one additional anti-corrosive agent that is different from said lower alkyl carboxylic acid moiety and which is also ingestible by humans.

20 55. The composition of claim 54, wherein said at least additional anti-corrosion agent comprises a 2,4-trans, trans-hexadiene moiety.

56. The composition of claim 55, wherein said 2,4-trans, trans-hexadiene moiety is in the form of a 2,4-trans, trans-hexadienoic anion.

25 57. The composition of claim 53, wherein said composition further comprises at least one compound capable of increasing the solubility of said anti-corrosion agent.

58. The composition of claim 35, wherein said composition further comprises a benzoic moiety.

59. The composition of claim 35, wherein said composition comprises a propionic anion, a 2,4-trans, trans-hexadienoic anion and a benzoic anion.

5 60. A method for preventing oxidative corrosion of a metal, comprising:  
applying an anti-corrosion composition to a surface of metal or a device  
containing a metal susceptible to oxidative corrosion, said composition comprising an  
effective amount of an anti-corrosion agent comprising a lower alkyl carboxylic acid  
moiety, said composition further comprising an additional acid compound which is  
10 different from said anti-corrosion agent, wherein said composition forms an anti-  
corrosive, moisture retentive barrier over said surface.

61. The method of claim 60, wherein said lower alkyl carboxylic acid moiety  
and said additional acid compound are ingestible.

62. The method of claim 61, wherein said lower alkyl carboxylic acid moiety  
15 is in the form of a lower alkyl carboxylic acid anion and wherein said additional acid  
compound is phosphoric acid.

63. The method of claim 61, wherein said lower alkyl carboxylic acid moiety  
is in the form of a lower alkyl carboxylic acid anion and wherein said additional acid  
compound is citric acid.

20 64. The method of claim 60, further comprising following said applying step  
the step of applying a further coating layer over said surface.

65. The method of claim 60, wherein said additional acid compound is present  
in an amount sufficient to provide a pH ranging from about 3 to about 10.

25 66. A composition for pretreating a metal to prevent oxidative corrosion  
thereof, comprising:  
an effective amount of an anti-corrosion agent, said agent comprising a lower  
alkyl carboxylic acid moiety; and



an additional acid compound which is different from said anti-corrosion agent present in an amount sufficient to provide a pH ranging from about 3 to about 10.

5        67.     The composition of claim 66, wherein said lower alkyl carboxylic acid moiety and said additional acid compound are ingestible.

68.     The composition of claim 67, wherein said lower alkyl carboxylic acid moiety is in the form of a lower alkyl carboxylic acid anion and wherein said additional acid compound is phosphoric acid.

10       69.     The composition of claim 67, wherein said lower alkyl carboxylic acid moiety is in the form of a lower alkyl carboxylic acid anion and wherein said additional acid compound is citric acid.

70.     A method of preparing a food and/or beverage preservative, comprising:  
adding a food grade polymer to an aqueous solution under conditions sufficient to hydrate said polymer;  
15       adding an ingestible anti-corrosion agent to said hydrated polymer to form a preservative composition; and  
optionally diluting said preservative composition.